

Request for Assistance  
Experimental Television Center Ltd.  
Program: Systems Approach to Video Art  
Contact: Don McArthur, Ralph Hocking

The goal of this project is the development of a system for synthesizing, processing and controlling video images with greater flexibility, reproducibility and precision than is presently possible. To extend the range available to the artist for image processing and generation, new components will be designed for the system and will include spatial and intensity digitizer, function generator, digital memory, analog to digital converter, digital to analog converter, sync generator with gen lock, time base corrector and chroma keyer. The system will also consist of conventional processing devices such as colorizers, keyers and special effects generators. The processing components require control signals which can be controlled by the artist using the computer interface.

The flow of information is shown in the attached diagram.

The video image is produced by an electrical signal; for a picture with fine detail the signal must be determining at time intervals of one-ten millionth of a second (100 ns). Consequently the artist must have devices which produce control signals at this rate in order to have maximum control of image production. These signals will be generated by control modules which are themselves controlled by signals from the computer. The computer processes information given to it by the artist in the form of program requests and numerical parameters. This information is analogous to a musical score. The computer behaves as an orchestra conductor in giving instructions to the control modules as required by the score but no faster than one set per frame. The control module, instrument operator, then executes the instructions producing point by point control signals for the processing modules. The processing modules correspond to the musical instruments in the orchestra.

Advantages of computer controlled systems include:

- Low system cost due to economies gained by small amount of general purpose hardware.

- Reliability with fewer control breakdowns

- Flexibility because set of general purpose modules behave in a specific way under computer control

- Speed

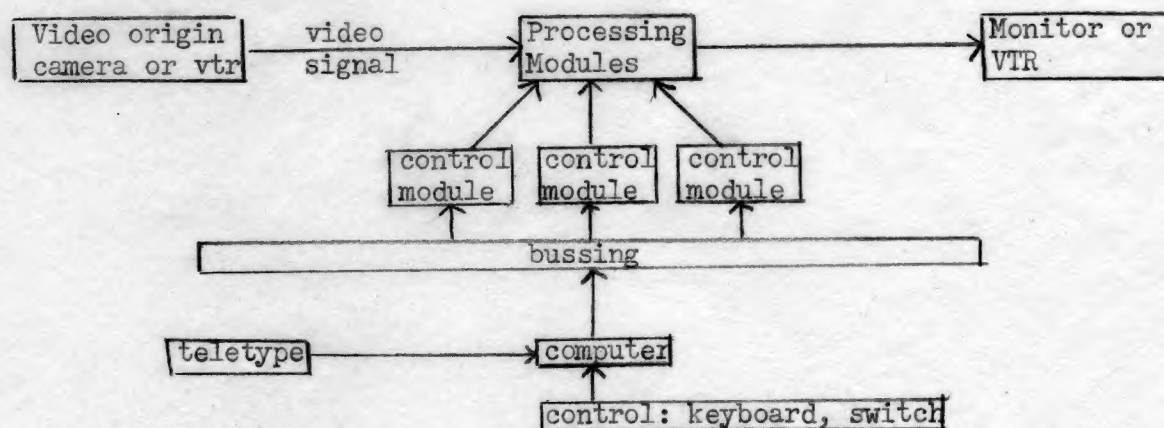
- Increased control over production by artists of precise imagery

Program cost: \$14,948.00  
see itemized budget

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Attachments: diagram and budget

Flow of Information in System Proposed:



Budget:

Parts:

Costs to build following integrated circuits

Programmable logic array	10	\$ 50.00
Line storage	2	500.00
Sync generator with gen lock	1	50.00
A/D	2	100.00
Multiplying A/D	4	80.00
Proc amp	2	20.00
Address decoder		100.00
Word latch		100.00
Keyer	4	60.00
D/A converter	50	500.00

Other necessary parts:

resistors		100.00
capacitors		100.00
connectors		100.00
bins	4	116.00
power supplies	16	800.00
pc cards	84	420.00
switches	84	252.00
solder, wire and hardware		50.00
chemicals to etch printed circuits		200.00

Equipment:

Intel computer	2,000.00
12" Trinitron receiver with monitor modification	450.00
Repair of Textronic scope	500.00
Stipend	8,000.00
Travel and subsistence	
purchase of parts in Boston area	300.00

\$14,948.00

# Resumé

Donald E. McArthur  
105 Tompkins St.  
Cortland, New York 13045

Telephone 607-756-7383  
607-749-4004

Personal: Born-Jan. 19, 1938 Holdrege, Nebraska

Education: Ph.D. Theoretical Physics Univ. of Nebraska 1967  
B. S. Physics and Math. Univ. of Nebraska 1959

## Employment:

1974 Visiting Associate Professor of Physics  
SUNY-Binghamton

1970-1973 Associate Professor of Physics  
SUNY-Cortland

1967-1970 Assistant Professor of Physics  
SUNY-Cortland

1964-1967 Research Associate  
University of Saskatchewan  
Saskatoon, Saskatchewan

1962-1964 Instructor of Physics  
University of Nebraska

1959-1962 N.S.F. Fellow  
University of Nebraska

Military Service: None

## Computer Experience:

Numerical solution of two-point boundary value problems.  
Electron beam optics calculations.

Languages: Fortran, APL, Burroughs 205- machine language

Interests: Heuristic Programming, Digital Electronics,  
Video systems, Electronic music.



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Don McArthur

Attachment

Don McArthur has been working at the Center for about six months. In this time he has designed and partially constructed the Spatial and Intensity Digitizer which is considered by several artists to be a major step forward in the development of systems for the artist. A videotape will be sent to the Council under separate cover which illustrates the machine in operation. His extensive background in the area of theoretical physics and his work with computers as well as his open and creative approach to systems design make him a unique and extremely valuable contributor to the development of video art tools. In the time that he has been with us he has had a powerful influence on the directions of the Center and has encouraged us to carefully consider the needs of the working video artist. We have long felt that the artist needs innovative tools with precise control, and Don has the knowledge and interest to design these systems at low cost. As indicated in the Center's proposal one of our main directions for 1975-76 will be the development of new video systems and the interface of computer control with image processing equipment such as the two types of colorizers available at the Center, the Paik/Abe Synthesizer and the Jones Gray Level Voltage Controlled Colorizer. As these tools are developed they will be made available to working artists at the Center and the information will be distributed to interested groups and individuals. The working relationship of Don McArthur, Walter Wright, Steina and Woody Vasulka, Nam June Paik and David Jones which the Center hopes to support will prove to be a vital influence on the evolution of the art. Don McArthur is central to this productive relationship, and we ask the Council to help support him. It should be noted that the Center intends to seek further support from other foundations, particularly the Rockefeller Foundation, for the support of Mr. McArthur's projects.